

Notice of Allowability	Application No.	Applicant(s)	
	10/645,389	TAN ET AL. (PW)	
	Examiner	Art Unit	
	William M. Brewster	2823	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--
All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 1 December 2005.
2. ☒ The allowed claim(s) is/are 1-15 and 38-45.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|---|--|
| 1. <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input checked="" type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date <u>121605</u> . |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date _____ | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____. |

EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Craig Buschmann (Reg. No. 57,829) on 20 December 2005.

The application has been amended as follows:

a) In the Claims

In claim 1, line 14, before "introducing" insert --subsequently--

In claim 2, line 17, before "introducing" insert --subsequently--

In claim 38, line 5, after "proper positions" insert -- wherein the alignment via of the rear surface of one semiconductor die is aligned with an alignment cavity of the mating semiconductor die--

line 9, before "underfilling" insert --subsequently--

Reasons for Allowances

The following is an examiner's statement of reasons for allowance: in claim 1, the features of lines 5-18, "placing a first semiconductor die having at least one alignment cavity on a surface thereof, such that the at least one alignment cavity of the first semiconductor die makes contact with the at least a first alignment droplet and is

Art Unit: 2823

positioned by surface tension thereof; placing a second semiconductor die having at least one alignment cavity on a surface thereof, such that the at least one alignment cavity of the second semiconductor die makes contact with the at least a second alignment droplet and is positioned by surface tension thereof; inducing the at least a first alignment droplet and the at least a second alignment droplet to at least partially solidify to maintain positions of the first semiconductor die and the second semiconductor die; and subsequently introducing an underfill material between the surfaces of the first and second semiconductor dice and the substrate to substantially fill a volume between each of the first and second semiconductor dice and the substrate, to extend laterally between the first and second semiconductor dice and to surround the at least a first alignment droplet and the at least a second alignment to form a reconstructed semiconductor wafer," cannot be combined from the prior art of record. Sundstrom US Publication No. 2002/006523 A1 teaches forming an underfill before the aligning. Many references, for example, Sasaki, US Patent No. 6,053,395 teach the alignment between a die and a circuit board or substrate, not between two dies as enumerated.

Neither Val, US Patent No. 5,637,536 and nor Anthony, US Patent No. 4,499,655 teach alignment cavities in the mating dies as in claim 38, lines 5-6. Further neither one specifies the subsequent underfilling in lines 9-11.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably

accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William M. Brewster whose telephone number is 571-272-1854. The examiner can normally be reached on Full Time.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Smith can be reached on 571-272-1907. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

William M. Brewster

20 December 2005
WB